

***Predictors of Repeat Pregnancy  
Michigan Adolescents Ages 10-19  
Years, 2003-2007***

***Special Supplemental Nutrition Program for Women,  
Infants & Children (WIC)***

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# **Acknowledgements**

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# ***Outline***

- Background & Significance
- Research Question
- Methods
- Results
- Discussion
- Public Health Implications

## ***Background & Significance***

Public health issue: Teen Pregnancy – younger teens

- Often lack adequate prenatal care<sup>1</sup>
- Increased risk of maternal health problems<sup>2-4</sup>
- Increased risk of poor birth outcomes<sup>5,6</sup>

Recent research indicates that increased risk is due to socioeconomic factors and not maternal age<sup>7</sup>

## ***Background & Significance***

### Teens with repeat pregnancy

- May have poorer birth outcomes
  - Increased neonatal and post-natal mortality<sup>8</sup>
  - Low birthweight, pre-term births-inconclusive
- Poorer life outcomes
  - Lower educational attainment
  - Unemployed
  - Welfare dependent<sup>9,10</sup>

## ***Background & Significance***

- Demographic characteristics associated with repeat pregnancy
  - Younger <sup>11</sup>
  - Hispanic<sup>10,11</sup> or Black non-Hispanic <sup>10</sup>
  - Stable relationship with baby's father<sup>12</sup> or young married <sup>10,12-13</sup>
  - Others found no relationship between race/ethnicity and repeat pregnancy<sup>14</sup>

## ***Research Question***

What are the predictors of repeat teen pregnancy among MI WIC participants?



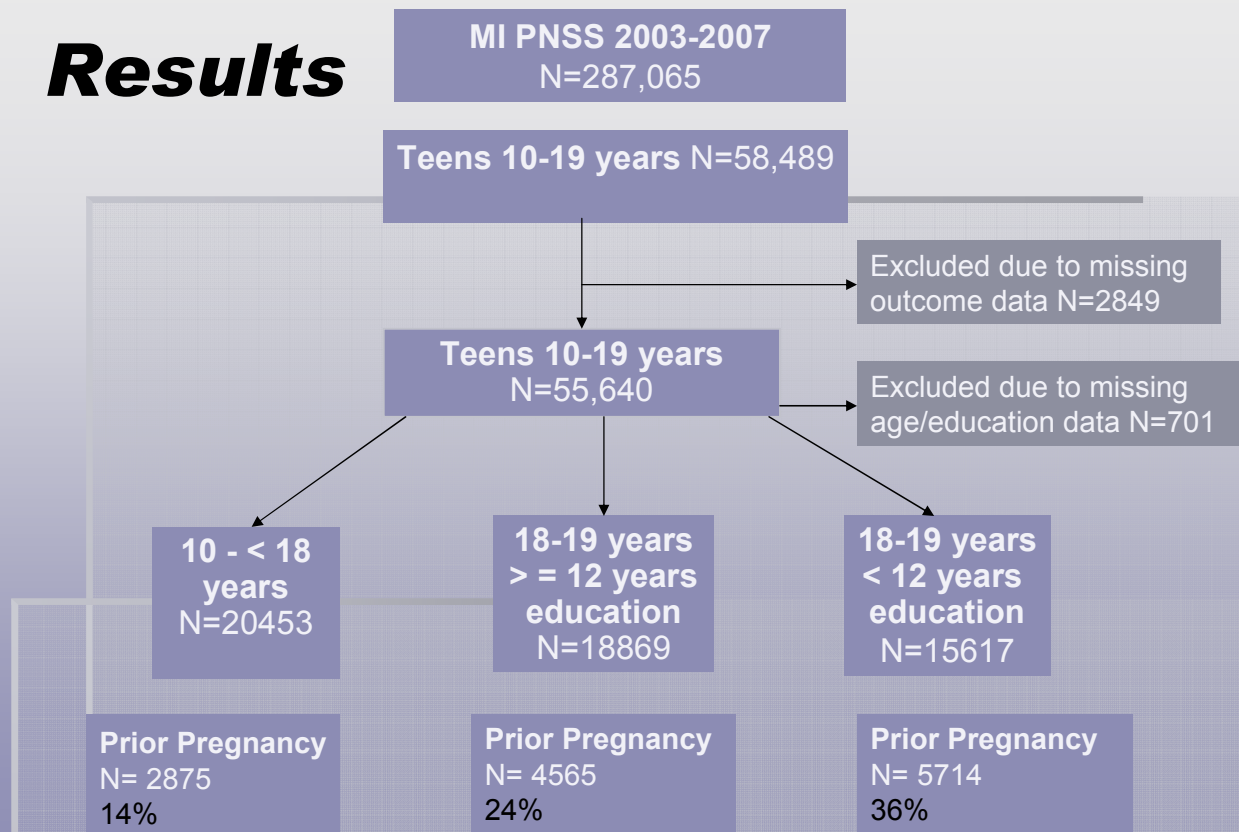
# ***Methods***

- Study population
  - Women 10-19 years of age enrolled in Michigan's WIC program 2003-2007
- Exclusion criteria
  - Missing outcome or predictor variable data
- Statistical Analysis-SAS 9.1
  - Exploratory Data Analysis
  - Logistic Regression

## ***Methods-Exploratory Analysis***

- Outcome:
  - **Repeat pregnancy**
- Predictor Variables:
  - Race/Ethnicity
  - Age/Education composite variable
  - Poverty level
  - Marital status
  - Maternal Prenatal Body Mass Index (BMI)
  - Smoking at 3 months prior to pregnancy

# Results



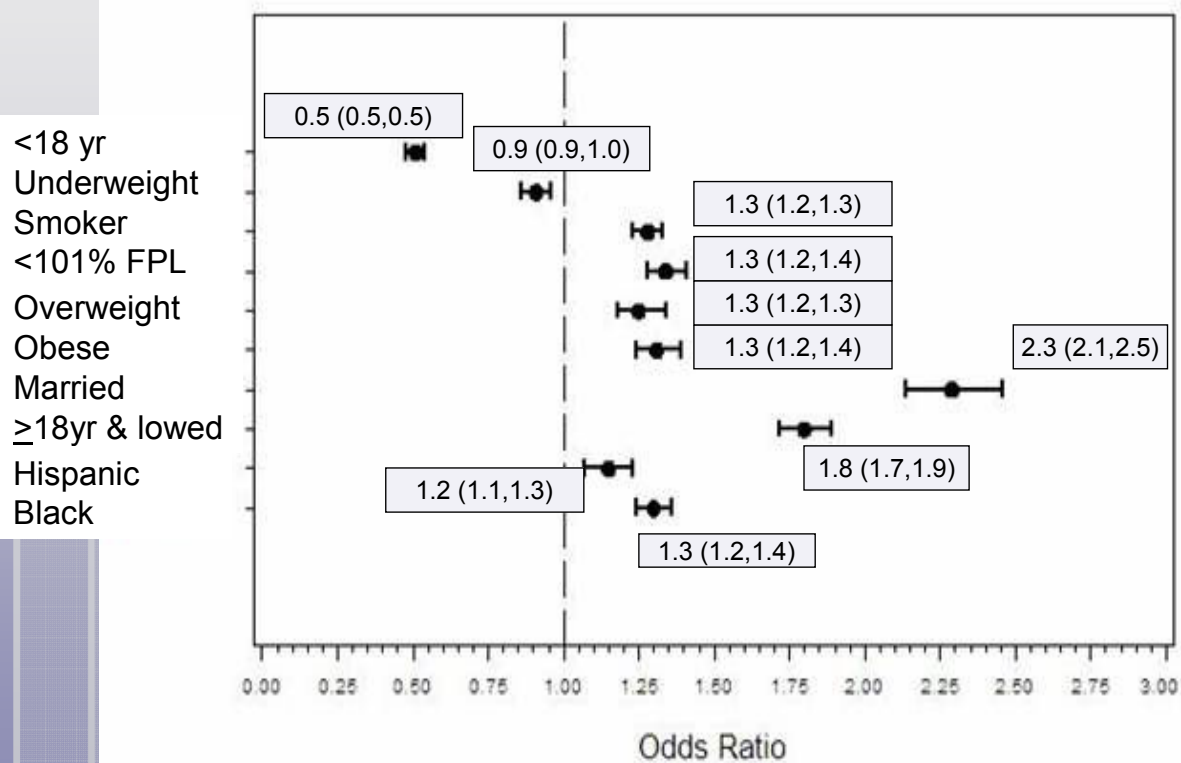
## ***Results-Univariate***

- Teens are 21% of the Michigan PNSS 2003-2007 cohort
  - 24% reported at least one previous pregnancy (95% CI 23.6, 24.3)
  - 66% had a pregnancy interval < 18 months (95% CI 65.6, 66.4)
  - 4.1% reported a previous birth (95% CI 3.9, 4.2)
- Number of previous pregnancies
  - Median: 1.0
  - Mean: 1.44 (95% CI 1.41, 1.47) among teens with previous pregnancy
  - 14% increase from 2003 to 2007 (1.4 to 1.6)

***Prevalence of repeat pregnancy by characteristics among teens  
10 -19 yrs, MI PNSS 2003-2007***

Characteristic		Number of subjects	% of Total	% Repeat Pregnancy	OR	95% CI
Race Ethnicity	White, non-Hispanic	30167	54.7	22.2	1.0	
	Black, non-Hispanic	18062	32.7	26.8	<b>1.3</b>	(1.2,1.3)
	Hispanic	5330	9.7	25.1	<b>1.2</b>	(1.1,1.3)
Age & Education	≥18y old & ≥ 12y edu	18869	34.4	24.2	1.0	
	≥ 18y old & < 12y edu	15617	28.4	<b>36.6</b>	<b>1.8</b>	(1.7,1.9)
	10-18 yrs of age	20453	37.2	14.1	0.5	(0.5,0.5)
Income	< 101% FPL	37956	72.7	24.9	1.3	(1.3,1.4)
	≥ 101% FPL	14249	27.3	19.8	1.0	
Marital Status	Married	3673	6.9	<b>40.4</b>	<b>2.3</b>	(2.1,2.5)
	Single	49672	93.1	22.7	1.0	
Smoking	Yes 3 months prior	8068	19.6	26.9	<b>1.3</b>	(1.2,1.3)
	No	33137	80.4	22.3	1.0	
Maternal prenatal BMI	Underweight	9366	17.5	21.2	0.9	(0.9,1.0)
	Normal weight	28254	52.9	22.8	1.0	
	Overweight	6401	12.0	27.0	<b>1.3</b>	(1.2,1.3)
	Obese	9439	17.7	28.0	<b>1.3</b>	(1.2,1.4)

**Estimated crude effects (OR) of demographic characteristics on repeat pregnancy among teens 10-19 yrs of age MI PNSS 2003-2007**



## ***Multivariate model predicting repeat pregnancy***

- Initial model -complex
- Initial model with no interaction terms
  - Failed Hosmer & Lemeshow test
- Stratify by age
  - Non-significant Hosmer & Lemeshow test
  - Lower c value than full model
  - Sacrifice some predictive power
  - Improve ease of interpretation of single effect

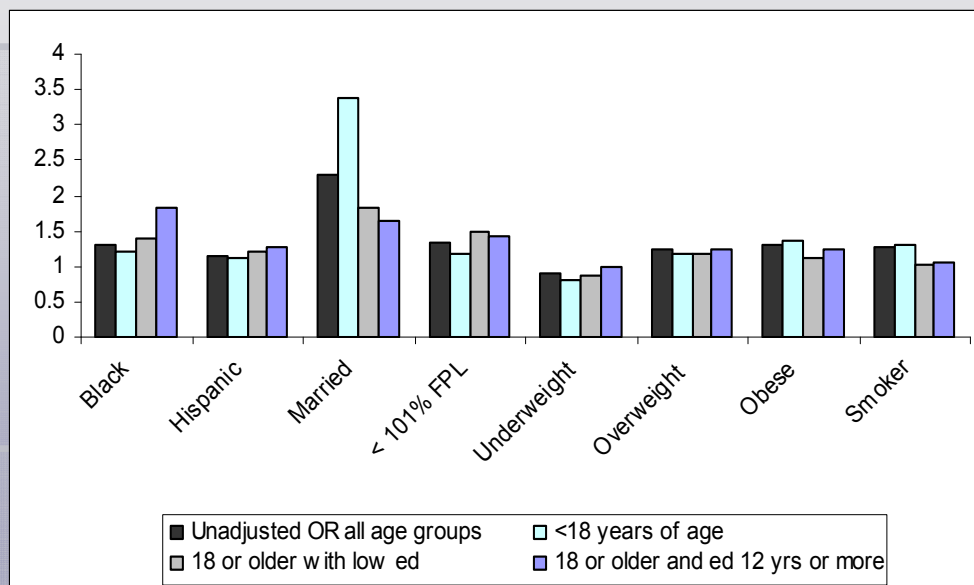
***Prevalence of repeat pregnancy by characteristics among teens 10 - 19 yrs by age/education, MI PNSS 2003-2007***

		< 18 years of age			≥ 18 years and education <12 years			≥ 18 years of age and education ≥12 years		
Characteristic		Number of subjects	% of Total	% Repeat Pregnancy	Number of subjects	% of Total	% Repeat Pregnancy	Number of subjects	% of Total	% Repeat Pregnancy
Race Ethnicity	White, non-Hispanic	9601	46.9	13.1	9107	58.3	34.0	11366	60.2	20.3
	Black, non-Hispanic	7965	38.9	15.4	4133	26.5	<b>41.8</b>	5903	31.3	<b>31.9</b>
	Hispanic	2295	11.2	14.3	1949	12.5	38.1	1059	5.6	24.3
Income	< 101% FPL	15395	75.3	14.6	12000	76.8	<b>38.6</b>	13336	70.7	<b>26.0</b>
	≥ 101% FPL	5058	24.7	12.5	3617	23.2	29.8	5533	29.3	19.9
Marital Status	Married	670	3.4	<b>34.0</b>	1464	9.9	<b>50.0</b>	1518	8.2	<b>33.6</b>
	Single	19189	96.6	13.3	13370	90.1	35.5	16951	91.8	23.4
Smoking	Yes 3 months prior	6004	32.5	<b>16.4</b>	7390	52.0	37.1	6680	38.6	24.9
	No	12489	67.5	13.2	6836	48.1	36.8	10621	61.4	23.8
Maternal prenatal BMI	Underweight	3776	19.0	11.3	2671	17.8	33.3	2887	15.7	22.9
	Normal weight	11101	55.8	13.6	7552	50.3	36.3	9512	51.8	22.9
	Overweight	2227	11.2	<b>15.7</b>	1865	12.4	40.4	1667	12.4	27.0
	Obese	2796	14.1	17.7	2932	19.54	39.2	2684	20.0	22.3

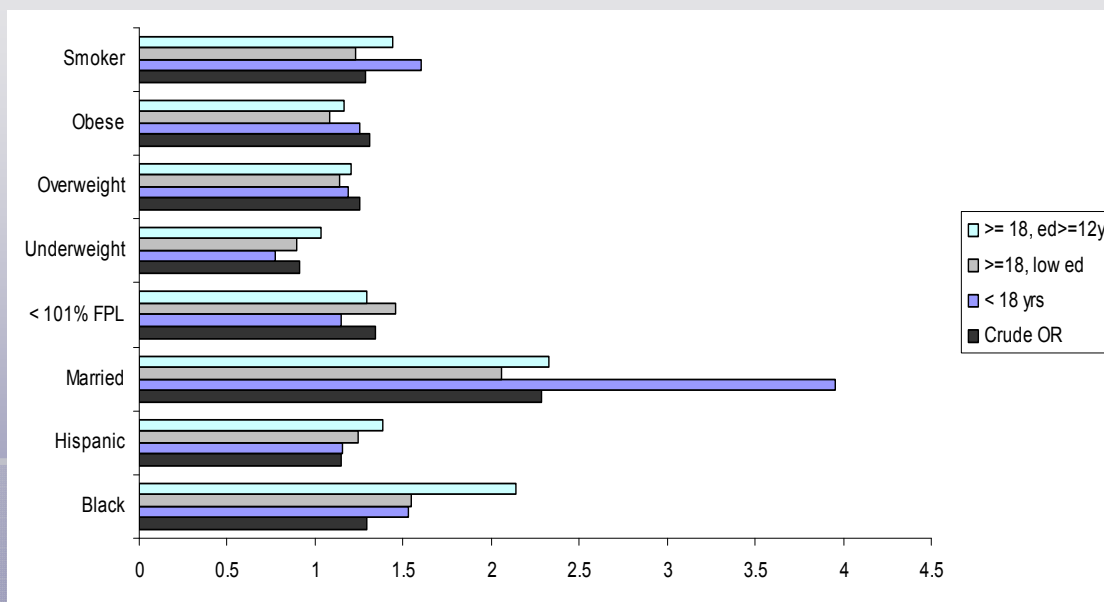


***Estimated unadjusted effects of demographic characteristics on repeat pregnancy among teens 10 -19yr of age, stratified by age/education MI PNSS 2003-2007***

OR



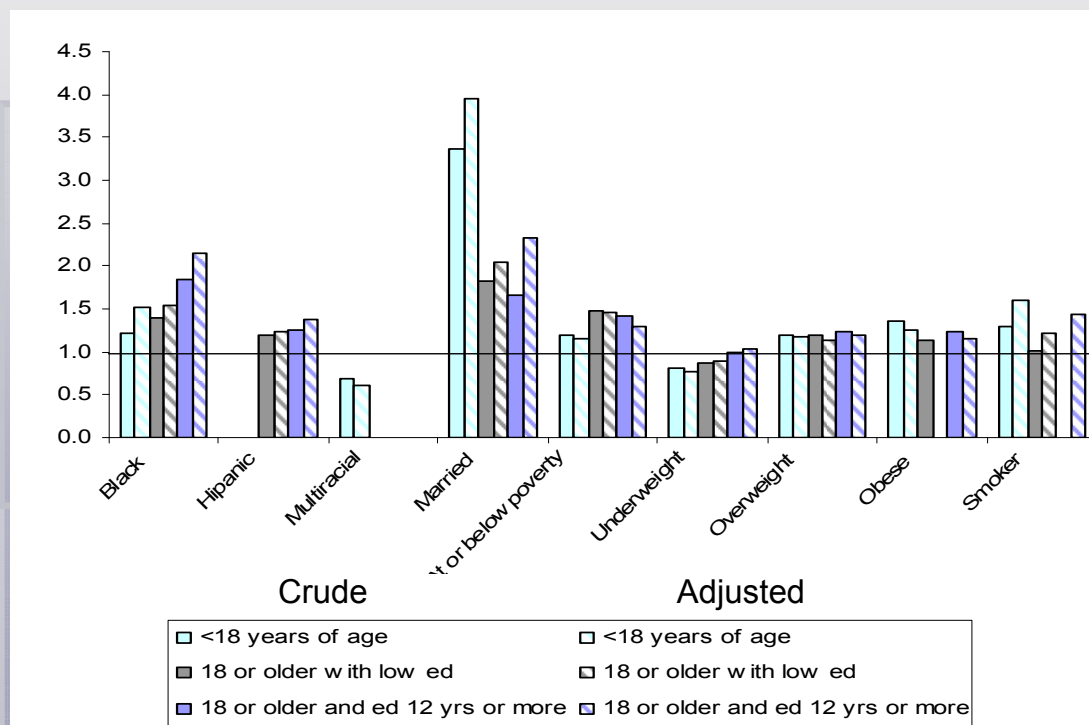
***Estimated adjusted effects of demographic characteristics on repeat pregnancy among teens 10 -19yr of age, stratified by age/education MI PNSS 2003-2007***



Model includes: race/ethnicity, marital status, poverty level, smoking & prenatal maternal BMI

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**Estimated crude and adjusted effects of demographic characteristics on repeat pregnancy among teens 10-19yr of age, stratified by age/education MI PNSS 2003-2007**



Model includes race/ethnicity, marital status, poverty level, smoking and BMI

## ***Discussion***

- Effects positively associated with repeat pregnancy among all age groups
  - Married
  - Black, non-Hispanic
  - Prenatal BMI Overweight
  - Smoking 3 months prior to pregnancy
  - Poverty Level less than 101% of FPL

## ***Discussion***

### Differences between age/education groups

- Married marital status –highest OR was among teens 10 < 18 years
- Hispanic ethnicity not significantly associated among teens 10 < 18 years
- Black, non-Hispanic – highest OR among teens 18-19 & at least 12 years education

# ***Discussion***

## **Limitations**

- WIC population differs from general population
- Limited predictor variables
- Unmeasured confounders likely
- Cross-sectional study design

## **Strengths**

- Study population is of public health concern
- Large sample size

## ***Public Health Implications***

- Teens ages 18-19 with repeat pregnancy were first pregnant at a younger age.
- Those at increased risk for repeat pregnancy should be targeted with interventions to:
  - address poverty,
  - improve education and health behaviors,
  - improve social support networks, and
  - advocate family planning & birth spacing

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***Thank You!***

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